

**CLAIMS**

What is claimed is:

1. A method of evaluating a welding process, comprising:  
5 providing a system to enable a user to select a plurality of welding processes for comparison;  
requesting data from a user to enable the system to produce a comparison between using each of the plurality of welding processes to weld a weld joint; and  
processing the requested data to produce the comparison between using each of the  
10 plurality of welding processes to weld the weld joint.
2. The method as recited in claim 1, wherein requesting data from a user comprises requesting the user to select a weld joint type corresponding to the weld joint and requesting the user to provide requested dimensional data for the weld joint based on the  
15 weld joint type.
3. The method as recited in claim 1, wherein processing the requested data to produce a comparison comprises producing a cost comparison between welding the weld joint using a first welding process and welding the weld joint using a second welding  
20 process.
4. The method as recited in claim 1, wherein the system comprises welding data stored in a database, further wherein the system compares a user's response to at least one of a series of data requests to the welding data stored in the database to provide the user  
25 with a recommended response to at least one of the series of data requests.

5. The method as recited in claim 1, wherein processing the requested data comprises producing a comparison between a first amount of filler material deposited using the first welding process to weld the weld joint and a second amount of filler metal deposited using a second welding processes to weld the weld joint.

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6. The method as recited in claim 1, wherein processing the requested data comprises producing a comparison between a first cycle time for welding the weld joint using a first welding process and a second cycle time for welding the weld joint using a second welding process.

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7. The method as recited in claim 6, wherein requesting data from a user comprises requesting pre-weld activity time and post-weld activity time associated with the first welding process, and the comparison between the first cycle time and second cycle time includes a reduction in at least one of the pre-weld activity time and post-weld activity time by using the second welding process.

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8. The method as recited in claim 1, wherein processing the requested data comprises producing a first heat input to the weld joint using the first welding process and a second heat input to the weld joint using a second welding process.

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9. A method of using a processor-based system to establish a cost associated with welding a weld joint, comprising:

enabling the processor-based system to provide a user with a request for a weld joint type corresponding to the weld joint;

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enabling the processor-based system to provide the user with a request for dimensional data for the weld joint based on the weld joint type provided by the user; and

enabling the processor-based system to establish the cost of welding electrode material used to weld the weld joint based on the dimensional data provided by the user.

5           10.     The method as recited in claim 9, wherein the requested dimensional data for the weld joint is adapted to enable the processor-based device establish the cross-sectional area of the weld joint.

10           11.     The method as recited in claim 9, wherein the requested dimensional data for the weld joint is weld joint length.

          12.     The method as recited in claim 9, wherein providing the processor-based device with requested dimensional data comprises entering data into a plurality of data cells, each data cell being labeled with a reference to a specific dimension of the weld joint.

15           13.     The method as recited in claim 9, further comprising:  
          enabling the processor-based system to provide the user with a request for electrode cost rate data; and

          enabling the processor-based system to establish the cost of welding electrode material used to weld the weld joint based on the electrode cost rate data provided by the user.  
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          14.     The method as recited in claim 9, further comprising:  
          enabling the processor-based system to provide the user with a request for labor cost rate data; and

25           enabling the processor-based system to establish the cost of labor used to weld the weld joint based on the labor cost rate data provided by the user.

15. The method as recited in claim 9, further comprising:  
enabling the processor-based system to provide the user with a request for power  
cost rate data; and  
enabling the processor-based system to establish the cost of power used to weld the  
weld joint based on the power cost rate data provided by the user.

16. A program stored in a tangible medium, comprising:  
programming instructions operable to direct a processor-based device to provide a  
request for weld joint dimensional data to a user;  
programming instructions operable to direct the processor-based device to provide a  
request for welding process data to a user; and  
programming instructions operable to direct the processor-based device to establish  
a cost of welding the weld joint based on the weld joint dimensional data and the welding  
process data provided by the user.

17. The program as recited in claim 16, comprising:  
programming instructions operable to enable the processor-based device to display  
the cost of welding the weld joint on the processor-based device.

18. The program as recited in claim 16, wherein the request for weld joint  
dimensional data enables the processor-based device to establish the volume of the specific  
weld joint.

19. The program as recited in claim 16, wherein the request for dimensional data  
comprises a spreadsheet comprising a plurality of cells, each cell being labeled with a  
reference to a specific dimension of the weld joint.

20. The program as recited in claim 16, wherein the program enables the processor-based device to establish the weld joint volume to establish the cost of welding the weld joint.

5 21. A method of analyzing a welding process, comprising:  
enabling a processor-based device to request data from a user to enable the processor-based device to establish energy inputted into a work piece during a welding operation; and  
operating the processor-based device to execute a program adapted to establish the  
10 energy input into the weld joint based on the requested data received from the user.

22. The method as recited in claim 21, wherein the requested data comprises welding voltage.

15 23. The method as recited in claim 21, wherein the requested data comprises welding current.

24 The method as recited in claim 21, wherein the requested data comprises the number of weld passes.

20 25. The method as recited in claim 21, wherein the requested data comprises welding travel speed.

26. A method of utilizing a processor-based device to establish cross-sectional  
25 area of a weld joint, comprising:  
enabling a user to input a weld joint type corresponding to the weld joint to the processor-based device;

providing a user with a request for dimensional data for the weld joint based on the weld joint type; and

processing the requested dimensional data to establish the cost of welding electrode material used to weld the weld joint.

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27. The method as recited in claim 26, wherein providing a request for dimensional data comprises providing an image of the selected weld joint type on the visual display, the image having a identifier corresponding to a dimension of the weld joint.

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28. The method as recited in claim 26, wherein enabling a user to provide the dimensional data comprises providing a data entry portion corresponding to the dimension on the visual display and providing a corresponding identifier to the identifier on the image.

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29. The method as recited in claim 29, wherein the data entry portion comprises a plurality of cells, each cell having an identifier disposed proximate thereto and corresponding to a specific dimension of the weld joint.

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30. The method as recited in claim 27, wherein the dimensional data comprises weld joint length and operating the processor-based device to execute a program also comprises establishing the volume of the weld joint based on the cross-sectional area of the weld joint and the weld joint length.

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31. The method as recited in claim 27, wherein enabling comprises providing a menu of weld joint types on the visual display.

32. A method of using a processor-based device to establish an amount of welding material deposited during a welding operation, comprising:

providing a user with a request for electrode data;  
providing the user with a request for shield gas data;  
providing the user with a request for weld joint dimensional data; and  
providing a program to enable the processor-based device to establish the amount of  
5 welding material deposited during the welding operation based on the electrode data, shield  
gas data, and weld joint dimensional data provided by the user.

10 33. The method as recited in claim 32, wherein the request for electrode data  
comprises a request for the type of electrode used.

34. The method as recited in claim 32, wherein the request for electrode data  
comprises a request for the diameter of electrode used.

15 35. The method as recited in claim 32, wherein the request for electrode data  
comprises a request for the wire feed speed.

36. The method as recited in claim 33, wherein the request for electrode data  
comprises a request for the operator factor.

20 37. The method as recited in claim 32, wherein the request for shield gas data  
comprises a request for the shield gas used.

38. A method of quantifying potential improvements to a manufacturing  
process, comprising:  
25 operating a processor-based device to display a plurality of activities associated with  
a manufacturing process;

providing a duration for performing each of the plurality of activities associated with the manufacturing process;

providing a potential decrease in the duration for performing at least one the plurality of activities associated with the manufacturing process; and

5           operating the processor-based system to establish a total potential decrease in duration for performing the manufacturing process based on the potential decreases in the duration for performing at least one of the plurality of activities of the manufacturing process.

10           39.     The method as recited in claim 38, wherein the display of a plurality of activities comprises a welding operation performed using a different welding process than a current welding process associated with the manufacturing process.

15           40.     The method as recited in claim 40, wherein inputting potential decreases in the duration for performing each of the activities of the current manufacturing process comprises operating the system to establish a decrease in duration for performing the welding operation using the different welding process compared to the current welding process.

20           41.     The method as recited in claim 40, wherein the plurality of activities comprises at least one pre-welding operation and at least one post-welding operation activity.

25           42.     A computer program, comprising:  
programming instructions stored in a tangible medium, wherein the programming instructions enable a user to operate a processor-based device to develop a map of activities associated with a manufacturing process and to enable the user to input potential decreases



in the duration of performing at least one activity associated with the manufacturing process.